

## Accepted Manuscript

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PII: S0393-0440(16)30214-5

DOI: <http://dx.doi.org/10.1016/j.geomphys.2016.08.010>

Reference: GEOPHY 2819

To appear in: *Journal of Geometry and Physics*

Received date: 9 May 2016

Revised date: 10 August 2016

Accepted date: 25 August 2016



Please cite this article as: D.S. Gritsenko, O.M. Kiriukhin, Differential invariants of feedback transformations for quasi-harmonic oscillation equations, *Journal of Geometry and Physics* (2016), <http://dx.doi.org/10.1016/j.geomphys.2016.08.010>

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# Differential invariants of feedback transformations for quasi-harmonic oscillation equations

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## Abstract

The goal and the main result of the paper is to provide a complete description of the field of rational differential invariants of one class of second order ordinary differential equations with scalar control parameter with respect to Lie pseudo-group of local feedback transformations. In particular, considered class describes behavior of conservative mechanical systems. We construct the class of rational differential invariants that separate regular orbits. It is well known that differential invariants form algebra with respect to the operation of addition and multiplication [1]. In our case, constructed rational differential operators form a field (in algebraic sense). Rational differential invariants were studied by M. Rosenlicht [2, 3], B. Kruglikov and V. Lychagin [4].

*Keywords:* quasi-harmonic oscillation equations, feedback transformations, jet spaces, infinitesimal transformations, Lie pseudo-groups, differential invariants, invariant derivations

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## 1. INTRODUCTION

The feedback classification and equivalence problem has drawn attention of the researchers for several decades. A variety of approaches for its treatment

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